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APPLICATION NO.	FILING DATE	FIRST NAME OF INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/773,798	02/07/2003	Douglas Duane Coolbaugh	BU R920000143US (13890)	8546

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EXAMINER

FARAHANI, DANA

ART UNIT PAPER NUMBER

2814

DATE MAILED 05/20/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/773 798

Applicant(s)

COOLBAUGH ET AL

Examiner

Dana Farahani

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION

- Extensions of time may be available under the provisions of 37 CFR 1.136(a), and no event, however, may be filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED. 35 U.S.C. § 133.
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 27 February 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of
- 1 ☐ Certified copies of the priority documents have been received.
- 2 ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_
- 3 ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other \_\_\_\_\_

**DETAILED ACTION**

***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitter Prior Art (AAPA), previously cited, in view of Klersy et al. (U.S. 5,177,567), hereinafter Klersy, and further in view of Sedra and Smith (a book, Microelectronic circuits), previously cited.

Regarding claims 1, 9, 13, 14, 15, and 18, AAPA discloses in figure 1 a method of providing a heterojunction bipolar transistor structure comprising at least an underlying SiGe base region 22, an insulator layer 26 formed on surface portions of the underlying SiGe base region, and an emitter 28 formed on the insulator layer and in contact with the underlying SiGe base region through an emitter opening formed in the insulator layer, the emitter, the insulator layer and the SiGe base region each having exposed sidewalls; and siliciding exposed silicon surfaces of at least the emitter and the SiGe base region.

AAPA does not disclose forming a passivation layer on the exposed sidewalls of the emitter, the insulator layer and portions of the SiGe base region.

Klersy teaches at column 10, lines 30-34, that a passivation layer protects the structure in which it is used, and further prevents short-circuiting. Therefore, it would

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have been obvious to one of ordinary skill in the art at the time the invention was made to form passivation layer on exposed sidewalls of the emitter, the insulator layer, and portion of the base region to protect those layers, and further isolate the emitter and the base contacts so there would be no shorts between base and emitter, so the transistor could be usable in a variety of applications, since it is well known in the art that a transistor in order to be usable in a variety of applications it should not have a shorted circuit between the base and the emitter (see Sedra and Smith, page 223, figure 4.2).

Regarding claim 13, AAPA discloses patterned insulator 26 of figure 1. However, AAPA does not disclose multiple patterned insulator layers. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use multiple insulator layer since mere duplication of the essential working parts of a device involves only routine skill in the art. *St. Regis Paper Co. v. Bemis Co.*, 193 USPQ 8.

3. Claims 2 and 5-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA in view of Hasegawa and further in view of Sedra and Smith as applied to claim 1 above, and further in view of Misium et al., hereinafter Misium (U.S. Patent 6,331,492), newly cited.

AAPA in view of Hasegawa and further in view of Sedra and Smith renders obvious the claimed invention, as discussed above, except for expressly disclosing the passivation layer is formed by CVD. Misium teaches that CVD is a well known, advantageous deposition method. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use CVD at the condition the applicant

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discloses, since it is known in the art CVD under those conditions is used to deposit layers in a semiconductor device and results in uniformity of the deposited layer.

4. Claims 3, 4, 16, and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA in view of Hasegawa and further in view of Sedra and Smith as applied to claim 1 above, and further in view of Nguyen et al. (U.S. Patent 4,987,102), hereinafter Nguyen, newly cited.

AAPA in view of Hasegawa, and Sedra and Smith, renders obvious the claimed invention, as discussed above, except for the passivation layer being made of nitride, oxide, and oxynitride, or any combination thereof. Nguyen discloses at column 5, line 30 that nitride is formed to be used in the semiconductor industry. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use these materials, specifically nitride, as the passivation layer since it is known in the art that these layers are used as passivation layer and nitride, for example, has good adhesive properties.

5. Claims 10 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA in view of Hasegawa, and Sedra and Smith, as applied to claim 9 above, and further in view of Vora (U.S. Patent 4,757,027), newly cited.

AAPA in view of Hasegawa, and Sedra and Smith renders obvious the claimed invention, as discussed above, except for an intrinsic emitter. Vora discloses at column 6, lines 36-47, an intrinsic emitter is formed in a transistor. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use intrinsic emitter so there would be no need for adding impurities to the emitter.

6. Claim 12 rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA in view of Hasegawa, and Sedra and Smith as applied to claim 9 above, and further in view of Van Zeijl (U.S. Patent 6,268,779), newly cited.

AAPA in view of Hasegawa, and Sedra and Smith renders obvious the claimed invention, as discussed above, except for a SiO<sub>2</sub> insulator.

Van Zeijl discloses at column 2, lines 52-53, that SiO<sub>2</sub> is used as an insulating layer. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use this material as the passivation layer of AAPA, since it is the most widely used insulator in the semiconductor IC industry.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dana Farahani whose telephone number is (703)305-1914. The examiner can normally be reached on M-F 9:00AM - 6:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri can be reached on (703)306-2794. The fax phone numbers for the organization where this application or proceeding is assigned are (703)872-9318 for regular communications and (703)872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

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D. Farahani

May 13, 2003

St.